Space Weather Forecast

Issued on Sunday, 20 November 2022 at 01:11 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor Storms, mainly day 1 (20th).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been at Moderate levels, with one Moderate flare observed from a small sunspot in the northwest disc at 19/1256 UTC, along with occasional Common class flares. Growth of this region has largely stalled. There are a total of five sunspot regions on the disc, with three further numbered regions in the eastern hemisphere, although these are stable. A further sunspot developed in the northwest. A number of CMEs (coronal mass ejections) were observed in the last 24 hours, including one from the flare, and two from eruptions of "filaments", which are lines of material held onto the Sun's surface by its magnetic field. These have been assessed as likely missing the Earth, although very slight glancing impacts aren't impossible on the 22nd.

Solar Wind / Geomagnetic Activity: Solar wind speeds persisted at background levels of around 350km/s. The total magnetic field was Moderate at first but eased to be weak by midnight. The north-south component was predominately positive (northward) with only a very brief spike to weakly negative (southward) values. The resultant geomagnetic activity was Quiet.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be mainly Low with a daily slight chance of rising to Moderate, with an ongoing potential for isolated Moderate flares.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs, however glancing interactions from the passing but missing CMEs on day 3 (22nd) are not impossible. Otherwise initially background winds are expected to become enhanced due to the arrival of fast winds from a coronal hole through day 1 (20th). Peak winds of 500-600km/s are possible day 2 (21st) before easing later in the period. Geomagnetic activity is expected to increase thro ugh day 1 (20th) from Quiet to be Unsettled to Active with a chance of G1/Minor Storm intervals, but also possible day 2 (21st) with ongoing fast winds. Conditions then easing to mostly Quiet with isolated Unsettled intervals day 3 (22nd) onward.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is forecast to persist at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	40	20	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	15	10	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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